



## **Concept Study Guidelines** *(update on Chart 4)*

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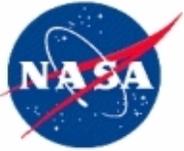
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NASA Science Office for Mission Assessments (SOMA)

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## Criteria and Guidelines for the Phase A Concept Study

Concept Study  
Guidelines

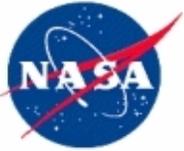
- The Criteria and Guidelines for the Phase A Concept Study is posted in the Program Specific Documents section of the Discovery Program Library (<https://discovery.larc.nasa.gov/dpl.html>).
- The document contains instructions for preparation of the Concept Study Report (CSR).
  - Concept Study Requirements are designated as CS-1 to CS-114.
  - Note the following language from the document:
    - All program constraints, guidelines, definitions, and requirements specified in the AO are applicable to the CSR, except as noted herein.
    - In case of conflict between the AO and the CSR Guidelines, the CSR Guidelines take precedence.
    - Because members of this evaluation team may not have reviewed, nor be provided access to Step 1 proposals, ***each CSR must be a self-contained document.***



## Criteria and Guidelines for the Phase A Concept Study (continued)

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Guidelines

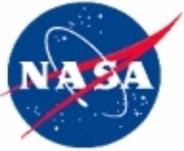
- The format of CSR is specified in Guideline Sections A through L.
- Note: Section B now contains the Executive Summary
- The CSR Structure and Page Limits are specified on page 14.
  - 5 pages for Executive Summary
  - 30 pages for Science Investigation (highlight changes from Step 1)
  - 130 pages + for Science Implementation, Mission Implementation, Management, Other Factors to be Evaluated (including SEOs, TDOs, and/or SCs if any), and Preliminary Design and Technology Completion (Phase B) Plan
  - No page limit for Cost Proposal (formats are specified).
  - 25 page limit each for Justification and Cost Proposal for optional SEO and/or TDO Activities.
  - No page limit for Section L, Appendices, on specific topics.
  - Appendices should not be renumbered.



## Criteria and Guidelines for the Phase A Concept Study (continued)

Concept Study  
Guidelines

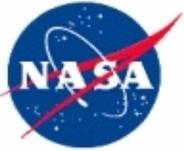
- Two signed originals of the CSR and five (5) CD-ROMs (CDs) or single-layer DVD-ROMs (DVDs) containing unlocked, bookmarked, and searchable PDF file(s) of the CSR – limited to the main body of the CSR, all tables, all appendices, and the MEL – as well as a separate PDF of the Fact Sheet, Microsoft Excel files of cost tables and the MEL, Microsoft Project schedule files, trajectory files, required references, and any optional cost files delivered **NLT 4 p.m. ET, November 19, 2020**.
- Materials identified as subject to U.S. export laws and regulations, in accordance with the Discovery 2019 AO Section 5.8.3, must be marked as described in requirement 95 of the AO and on page 17 of the CSR guidelines document.
- Provide a draft list of the participants as a Microsoft Excel spreadsheet document to the point-of-contact listed below, three months prior to the due date of the CSR **(4:00pm EST, Wednesday, August 19)**. Use the Microsoft Excel spreadsheet template that has been posted to the Program Library. This list is to be updated and a final revision shall be included on the CD or DVD at the time of CSR submission.



## Updated Criterion C Factors

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- Factor C-2, “Adequacy and robustness of the mission design and plan for mission operations”.
  - Addition of subfactor for scientific measurements planning and decision-making processes (including any priorities assigned to specific measurements and plans to update the measurement strategy based on early measurements), and the schedule and workforce allocated to these processes
- Factor C-4, Adequacy and robustness of the management approach and schedule, including the capability of the management team.
  - Addition of subfactor for small business subcontracting plan including small disadvantaged businesses.
  - Risk management aspects moved to new Factor C-6.



## Additional Criterion C Factors

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- Factor C-6, Adequacy of the risk management plan.
  - Includes risk management aspects of Factor C-4
- Factor C-7, Ground systems.
  - Assessment of the proposed mission operations plans, facilities, hardware and software, etc.
- Factor C-8, Approach and feasibility for completing Phase B.
  - Assessment of the completeness of plans.
  - Assessment of the adequacy of the approach.
- Factor C-9, Implementation feasibility and risk of any proposed use of NASA-developed technology
  - Assessment of whether the plan for any proposed infusion of NASA-developed technology adequately interfaces with, integrates, and uses the NASA-developed technology



## Updated/New Criterion B Factors

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Guidelines

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- Factor B-1, Merit of the instruments and mission design for addressing the science goals and objectives.
    - Includes details on data collection strategy and plans.
  - Factor B-2, Probability of technical success.
    - Includes assessment of technology readiness, heritage, environmental concerns, accommodation, and complexity of interfaces for the instrument design.



## Heritage

- Heritage is not an evaluation criterion. However, it is an aspect of multiple evaluation criteria, factors, and subfactors.
- In considering the heritage of any aspect of the mission, the evaluation team will consider the design, manufacture, software, provider, use, operating environment, referenced mission, and other factors. The evaluation team will consider the degree of difference between the proposed use and the referenced (heritage) use. The evaluation team will assess whether the degree of modification is consistent with any risk mitigation claimed and whether the degree of modification is consistent with any cost savings claimed.



## **Guidelines: Step-1 Deferrals Required in Step 2**

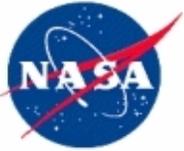
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- Updated Planetary protection plans (see AO Section 5.1.5 and J.6)). Note that the baseline Planetary Protection Plan is due at PDR.
  - Updated Curation plan elements (see AO Sections 4.4.4 and 4.4.6, Requirement 6, Requirement 9, and Requirement B-64)
  - Detailed disposal plan (see AO Section 5.2.7)
  - Science Enhancement Option (SEO) (see AO Section 5.1.6)
  - Technology Demonstration Opportunities (TDO) (see AO Section 5.1.7)
  - Student Collaboration (SC) (see AO Section 5.5.3)
  - Independent Verification and Validation of Software (see AO Section 4.6.1)
  - Conjunction Analysis Risk Assessment (see AO Section 4.6.4)
  - Schedule-based end-to-end Data Management and Archiving Plan (see AO Requirement B-24, and Section E.5 in this document)
  - Requirements for real year dollar costs at the WBS level (see AO Requirement B-51, Requirement B-52, and Requirement CS-70 in this document)



## Part II, Required Quantities, Media, Format, and Content

- Requirement CS-8. Provide a list of the individuals who have participated in the concept study (e.g., individuals who worked on the CSR, any CSR contributor, Red Team member, reviewer, etc.) and/or whom you are proposing to provide work should the mission be downselected. Additionally, provide a list of all organizations named in the CSR, or providing developmental or research services, including the lead organization, subcontractors, vendors and contributing organizations who have an interest in the mission. Provide a draft list of the participants as a Microsoft Excel spreadsheet document to the point-of-contact listed below, three months prior to the due date of the CSR. Use the Microsoft Excel spreadsheet template that has been posted to the Program Library. This list is to be updated and a final revision shall be included on the CD or DVD at the time of CSR submission.
- Requirement CS-9. Create a separate document that contains a table with all of the requirements (Requirement CS-1 through Requirement CS-114) and the page, section, or table number that is the main place in the CSR where the requirement is addressed. Provide this table as a PDF document to the point-of-contact for the Discovery AO by email no later than seven days after the CSRs are due.



## Section G, Management

- Provide quantitative risk assessments, where the probability and impact of occurrence are independently and numerically specified prior to mitigation; specification of probability and impact after mitigation is encouraged but not required. The products of pre-mitigation probabilities and impacts are to be included as encumbered cost reserves or explicitly identified in the basis of estimate, including cost validations.



## Section I, Preliminary Design And Technology Completion (Phase B) Plan

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Guidelines

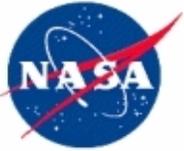
- Once entering Phase B, Discovery projects will be subject to the same requirements as all other NASA missions. Note that the CSR only satisfies some of the KDP-B deliverable requirements, and that the balance will have to be developed early in Phase B (consistent with Section 2.2.7.1 in NPR 7120.5E: "In a two-step AO process, projects are down-selected following evaluation of concept study reports and the down-selection serves as KDP B. Following this selection, the process becomes conventional with the exception that products normally required at KDP B that require Mission Directorate input or approval will be finished as early in Phase B as feasible.").



## Appendix L.17 “Additional Cost Data to Assist Validation (Optional)”

Concept Study  
Guidelines

- In addition to the specific cost table data requested in the Cost Proposal (Section J), investigation teams may also provide any additional costing information/data that they feel will assist NASA to validate the project’s proposed costs. Vendor quotes, cost estimates, rationale for design heritage cost savings, are all examples of data that can be included here. Benchmark cost model input and output files (AO Requirement 73 and AO Requirement B-54) are not required. However, analogous files for any publicly available cost model may be included on each submitted CD/DVD, if accompanied by discussion in this appendix.



## Appendix L.19 “Communications Design Data”

Concept Study  
Guidelines

- Requirement CS-108. Provide the detailed plans —regardless of current exemption status—addressing the AO Space System Protection Requirements 46–48 on protection of uplink commands using approaches compliant with FIPS 140-2 Level 1 and NASA-STD-1006; the ability of command uplink, position, navigation, and timing subsystems to recognize and survive interference; and protection of command uplink information at no less than the Sensitive But Unclassified level. Quantify the impacts (e.g., cost, schedule, and risk) of the imposition of Requirement 46 at KDPs B, C, and D.



## Appendix L.21 “References List”

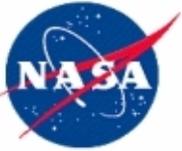
Concept Study  
Guidelines

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- Requirement CS-102. This section shall provide a list of any internal program and project management standards to be used in the proposed development (e.g., GEVS, “Golden Rules”). To the extent practicable, the documents shall be included on the CD/DVD.



## Site Visits

- Site visits with oral briefings will be used to clarify implementation details and commitments.
- Site visits are anticipated during the **February/March 2021** timeframe at location sites to be coordinated between the PI/Proposal Team and NASA HQ/SOMA.
- Briefings for each site visit will be limited to approximately eight hours.
- All site visit presentations/briefings should be in a plenary session with all Evaluation Team members attending - no splinter sessions.
- Written Significant weaknesses, Questions, and/or Requests for information Lists (SQRLs) will be provided to the PI/Proposal Team 8 calendar days before the site visit. All teams will have the same lead time.
- Any additional information provided to NASA by the investigation team at the site visit, in response to the NASA-identified SQRLs, or in response to NASA requests for additional information, will be treated as updates and clarifications to the CSR.



## Range of Cost and Schedule (RCS)

- Range of cost and schedule (RCS) estimates will be provided to the Selection Official. The information in the CSRs, responses to questions, and information provided at site visits will be considered in preparing the RCS estimates. Findings generated by the Evaluation panel will also be considered when generating the RCS estimates.
- Driven by NPR 7120.5E:
  - 2.4.3.1 Tightly coupled and single-project programs (regardless of life-cycle cost) and projects with an estimated life-cycle cost greater than \$250 million shall provide a range of cost and a range for schedule at KDP 0/KDP B, each range (with confidence levels identified for the low and high values of the range) established by a probabilistic analysis and based on identified resources and associated uncertainties by fiscal year. Separate analyses of cost and schedule, each with associated confidence levels, meet the requirement. A joint cost and schedule confidence level (JCL) is not required but may be used at KDP 0 and KDP B.